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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,116	09/28/2005	Klaus Balling	R.304865	4388
2119 7590 10/15/2007 RONALD E. GREIGG GREIGG & GREIGG P.L.L.C. 1423 POWHATAN STREET, UNIT ONE ALEXANDRIA, VA 22314			EXAMINER COLEMAN, KEITH A	
			ART UNIT 4175	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/551,116

**Applicant(s)**

BALLING, KLAUS

**Examiner**

Keith A. Coleman

**Art Unit**

3709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/28/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 10-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Pace et al. (US Patent No. 5,666,927).

With regards to claim 10, the patent to Pace et al. discloses a method for flushing air from injection valve (10, Col. 4, Lines 37-39) such as a common rail injector for an internal combustion engine which injection valve (10, Col. 4, Lines 37-39) on being put into operation is initially at least partly filled with air (Col. 5, Lines 45-50) and to which a liquid medium is supplied via a typical connection for supplying fuel (Col. 5, Lines 45-50), the method comprising pressurizing an inner chamber of the injection valve to a pressure that is reduced compared to normal operation (Col. 5, Lines 50-64), whereby existing air bubbles increase in volume compared to the volume in normal operation (Col. 3, Line 15), and flushing the medium contained in said inner chamber (Col. 5, Lines 35-50), at a reduced pressure that remains at least approximately constant (46, Col. 4, Line 33), and selectively repeating these steps multiple times (Col. 5, Lines 35-50).

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With regards to claim 11, the patent to Pace et al. discloses supplying control signals for opening and closing the injection to the injection valve (Col. 1, Lines 15-21). It is inherent that control signals are provided since Pace et al. explicitly discloses that the fuel injectors are opened and closed via an electromagnetic actuator.

With regards to claims 12 and 13, the patent to Pace et al. discloses supplying a low-pressure medium (i.e. fuel, Col. 5, Lines 53-56) to reinforce the flushing out of the medium after leaving the injection valve (18, Col. 5, Lines 45-50). Since Pace et al. explicitly discloses that atomized fuel is flushed out (Col. 54, Lines 45-50) and fuel is optionally supplied at 10% pressure drop, the fuel with the pressure drop is inherently a low-pressure medium compared to normal operations.

With regards to claims 14-17, the patent to Pace et al. discloses an adaptor head (10, Col. 4, Line 38, See Figure 1), to be connected to a low-pressure connection of the injection valve (18, Col. 4, Lines 25-27), which adaptor head can be made to communicate with a vacuum pump (42, Col. 4, Lines 30-32), and a device (52, Col 4, Lines 41-45) for supplying medium (i.e. fuel, Col. 5, Lines 52-55) at high pressure (Col. 4, Lines 41-45) to a standardly provided connection of the injection valve (18). 300 kPa is interpreted as high pressure.

With regards to claim 18, the patent to Pace et al. discloses wherein the adaptor head (10, Col. 4, Lines 50-55) has a connection that is in communication with a low-

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pressure connection for a flushing medium (Col. 5, Lines 45-50). Since Pace et al. explicitly discloses that atomized fuel is flushed out (Col. 5, Lines 45-50) and fuel is optionally supplied at 10% pressure drop, the fuel with the pressure drop is inherently a low-pressure medium compared to normal operations.

With regards to claims 19 and 20, the patent to Pace et al. discloses wherein the apparatus further comprise a return tank (50, via lines 48 and 54, Col. 4, Lines 50-55) for the return quantity in communication with the adaptor head (10, Col. 4, Lines 38-40, See Figure 2).

With regards to claims 21-24, the patent to Pace et al. discloses a switching valve (58 or 60, Col. 4, Lines 53-55) for controlling chronological events of the apparatus (Col. 4, Lines 54-65). Since Pace et al. explicitly discloses that switches (58 and 60) are activated when the engine is shut off, and upon restarting the re-pressures the injectors for atomization, ejection, and then further flushing, these automated methods are interpreted as chronological events.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pace et al. (US Patent No. 5,666,927) in view of Schechter (US Patent No. 5,390,647).

With regards to claims 25-28, the patent to Pace et al. discloses an electronically actuated switching valve that is responsive to both pressure and engine start-up and shutdown. Pace et al. does not positively disclose a control device connected to a control terminal of the switching valve but does explicitly mentions a self-regulating system (Col. 2, Lines 46-48) and explicitly stating that valve and injectors can be

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electrically operated (Col. 4, Line 55, Col. 1, Lines 65-67). Schechter discloses a control device (Col. 6, Lines 63-68) connected to a control terminal of the switching valve (106,108). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the engine of Pace et al. with a control device in view of the teaching to Schechter, in order to control the fuel injection and air timing (Col. 6, Lines 60-67 through Col. 7, Lines 1-25).

With regards to claim 29, the patent to Pace et al. discloses an electronically actuated needle valve in a fuel injector (Col. 1, Lines 15-21, Col. 4, Lines 55-58, Col. 5, Lines 10-16) that is responsive to the conditions of the engine. Pace et al. does not positively disclose the control device is coupled to an electrical terminal of the injector but does explicitly mentions a self-regulating system (Col. 2, Lines 46-48) and the injectors being electromagnetically actuated (Col. 1, Line 15). Schechter discloses a control device (Col. 6, Lines 63-68) is coupled to an electrical terminal of the injector (24, connected via 106 and 108). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the engine of Pace et al. with a control device in view of the teaching to Schechter, in order to control the fuel injection and air timing (Col. 6, Lines 60-67 through Col. 7, Lines 1-25).

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**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pace et al. (US Patent No. 5,730,367) shows the current state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith A. Coleman whose telephone number is 571-270-3516. The examiner can normally be reached on Monday through Friday between 8-5 Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrence Till can be reached on (571) 272-1280. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BRIAN NASH  
10/2/07  


Terrence R. Till  
Supervisory Patent Examiner

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